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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,794	07/10/2003	Panayotis Andricacos	20140-00302-US /YOR920030	3511

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CONNOLLY BOVE LODGE & HUTZ LLP
SUITE 800
1990 M STREET NW
WASHINGTON, DC 20036-3425

EXAMINER	
SMITH, NICHOLAS A	

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/615,794	ANDRICACOS ET AL.	
	Examiner	Art Unit	
	Nicholas A. Smith	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/8/2006 has been entered.

Status of Claims

Claim 1 has been cancelled. Claims 2-14 remain for examination. Claim 15 is new.

Status of Rejection

The rejection of claims 2-5 and 9 under ***35 USC § 102*** have been withdrawn due to the amended features of claim 15.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-5, 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seita et al. (US Patent 6,881,319) in view of Chalyt et al. (US Patent 6,749,739) and further in view of Blachier (US Patent 6,569,307).

Claim 15 is a rewrite of cancelled claim 1 with amended features. In regards to unamended features of claim 15, Seita et al. is applied to the claim for the same reasons as stated in the previous office action.

In regards to amended features "determining a void-formation marker (VFM) ratio at each of a plurality of time-points; wherein said VFM ratio is the concentration of said VFM divided by the concentration of said accelerator," "counting, for each of said time-points, the number of voids in the metal plated on said substrate" and "determining said threshold concentration as the largest VFM ratio at which no voids are observed" of claim 15, Seita et al. does not specifically teach these steps. While Seita et al. teaches the need to stay below a threshold VFM concentration (col. 5, lines 64-67), Seita et al. does not teach the specifics of the above features.

Regarding amended features "determining a void-formation marker (VFM) ratio at each of a plurality of time-points," Chalyt el al. teach a method for detecting the breakdown of plating bath additives comprising periodically determining a ratio of suppressor breakdown product to suppressor concentration, and correlating this parameter with the deposit quality in order to define an acceptable concentration range for the breakdown product (column 7, lines 36-42). Note that the step of plating a substrate is inherent to this process. Also, while Chalyt's invention is specifically mentions "suppressor breakdown product," is it not limited to only suppressors as Chalyt's invention is concerned with "analysis of organic additives and contamination in plating baths" of which accelerators are naturally included (Chalyt et al., col. 1, lines 14-16). It would have been obvious to one of ordinary skill at the time of invention to

modify Seita et al.'s method by Chalyt et al. steps in order to provide a means of providing control over the deposition properties (Chalyt et al., col. 1, lines 14-16).

However, in regards to amended features "counting, for each of said time-points, the number of voids in the metal plated on said substrate" and "determining said threshold concentration as the largest VFM ratio at which no voids are observed," Seita et al. in view of Chalyt et al. does not specifically teach counting the number of voids and setting the acceptable range (or threshold value) for the byproduct concentration according to the number of voids.

Blachier et al. teach a method for plating objects wherein certain aspects of the plating process are monitored in order to maintain the byproduct concentration below a predetermined value. In one embodiment, the degree of void-free plating is measured, which is equivalent to counting the number of voids (column 7, lines 49-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Seita et al. in view Chalyt et al.'s by counting the number of voids as taught by Blachier et al., and using this value to determine the threshold value, because Blachier et al. teach that monitoring this aspect provides an indication of the condition of the plating substances (column 7, lines 62-64).

Regarding amended feature "wherein said VFM ratio is the concentration of said VFM divided by the concentration of said accelerator", Seita et al. in view of Chalyt et al. do not specifically teach that the VFM ratio is the concentration of a void-formation marker (accelerator breakdown product) divided by the concentration of the accelerator.

However, it would have been obvious to one of ordinary skill in the art to measure the ratio of accelerator breakdown product to accelerator concentration (instead of the ratio of suppressor breakdown product to suppressor concentration as taught by Chalyt et al.), because Blachier el al. teach that the accelerators tend to break down fast than the suppressors (column 1, lines 55-57).

In regards to claims 2-5 and 9, Seita et al. in view of Chalyt et al. and further in view of Blachier et al. is applied to the claims for the same reasons as stated in the previous office action.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seita et al. in view of Chalyt et al. and further in view of Blachier as applied to claim 3, and further in view of Skoog et al. (Fundamentals of Analytical Chemistry 7th Ed.; Saunders College Publishing , Fort Worth, **1996**, pp. 701-702 and 708-709).

In regards to claim 6, Seita et al. in view of Chalyt et al., further in view of Blachier and further in view of Skoog et al. is applied to the claim for the same reasons as stated in previous office action dated 9/13/2005.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seita et al. in view of Chalyt et al. and further in view of Blachier as applied to claim 2, and further in view of Talasek et al. (US 2004/0108213).

In regards to claims 7-8, Seita et al. in view of Chalyt et al., further in view of Blachier and further in view of Talasek et al. is applied to the claims for the same reasons as stated in previous office action dated 9/13/2005.

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chalyt et al. (US Patent No. 6,749,739) in view of Blachier et al. (US Patent No. 6,749,739).

In regards to claims 10-11, Chalyt et al. in view of is applied to the claims for the same reasons as stated in the previous office action.

In regards to the amended features of claim 10 in "concentration of VFM divided by the concentration of accelerator," this amended feature is substantially the same as claim 11 and therefore the same reasons are applied as in the previous office action.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seita et al. in view of Kopp (US Patent No. 6,083,374).

In regards to claims 12-14, Seita et al. in view of Kopp is applied to the claims for the same reasons as stated in previous office action dated 9/13/2005.

Response to Arguments

Applicant's arguments filed 5/8/2006 have been fully considered but they are not persuasive.

Applicant argues:

1. The pre-determined values of Seita et al. (Seita et al., col. 5, lines 56-57) do not relate to void-formation.
2. Seita et al. does not teach determination of a VFM ratio nor relate this VFM ratio to a threshold concentration for void-free plating.

3. Neither Chalyt et al. nor Blachier et al. teach a threshold concentration as the highest non-voiding VFM concentration divided by the accelerator concentration.

Examiner responds:

1. The pre-determined values of Seita et al. (Seita et al., col. 5, lines 64-67) do relate to void-formation; see "good via-filling property" (col. 5, line 64). Seita et al. also relates the intention of filling vias with achieving "the via-filling with voids" (abstract).
2. See reasons stated above on p. 3 and p. 4.
3. See reasons stated above on p. 3 and p. 4. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas A. Smith whose telephone number is (571)-272-8760. The examiner can normally be reached on 8:30 AM to 5:00 PM, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571)-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700